USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002ND7B

Title: Feedlot Runoff and Manure Management Modeling

Project Type: Research

Focus Categories: Waste Water, Management and Planning, Hydrology

Keywords: feedlot runoff, modeling

Start Date: 04/01/2002

End Date: 07/31/2002

Federal Funds Requested: $5,656

Non-Federal Matching Funds Requested: $11,543

Congressional District: First

Principal Investigator:
James Lindley
North Dakota State University

Abstract

The overall goal of this research is to develop a complete feedlot runoff and manure management model to predict runoff and its concentrations generated from feedlots, and develop an online GIS database.

Preservation of environmental quality makes it essential that feedlot runoff be handled and controlled appropriately to prevent water contamination. Regulations, such as Clean Water Act, provide enforceable criteria for environmental protection from contamination by livestock production. Since the animal manure is exposed to the runoff, pollution potential of the feedlots depends on the size of operation, rainfall intensity, duration and frequency. According to data obtained from G. Haberstroh of North Dakota State Department of Health, there are 106,874 animal units (1 animal unit = 500 kg of live weight) of beef cattle have been growing in North Dakota. The importance of the feedlot operations in the State, pollution potential of feedlot runoff, and regulations make it imperative to pay more attention to animal operations, especially feedlots to protect water resources.

Some watershed based hydrological and water quality models have been adapted to feedlot. A manure management plan model also has been decided to use in the study. A paper describing these models has been presented in ASAE Annual Meeting. In order to validate the hydrological and water quality models, field experiments have been conducted. Runoff measurements (quantity, quality), and manure sampling have been completed.